

NEW BEDFORD HARBOR SUPERFUND SITE  
SUMMARY OF ARMY CORPS STUDY PROPOSAL

OCTOBER, 1985

The U.S. Army Corps of Engineers, at the request of the Environmental Protection Agency, is conducting studies for the New Bedford Focused Feasibility Study (FFS) of the cleanup options for the hot spot area. The primary objective of the Corps of Engineers study is to develop the technical information necessary to further evaluate the engineering feasibility of a number of dredging and disposal alternatives for contaminated sediments in the Acushnet River Estuary, north of the Coggeshall Street bridge. The Corps of Engineers' study will not repeat work done in EPA's previous studies, but instead will provide more detailed information specific to New Bedford Harbor on the potential impacts of dredging and disposal.

During its investigation, the Corps will develop a baseline physical and chemical characterization of the hot spot area, assess the magnitude and migration potential of contaminant releases, conduct innovative laboratory and other testing procedures to predict the behavior of the harbor sediments, and provide alternative(s) and concept design cost estimates. The study will focus on subsurface cell disposal and near-shore confined disposal in the adjacent intertidal environments. The work will be accomplished in the following seven tasks: (1) Baseline Maps and Controls; (2) Sediment Characterization; (3) Geotechnical Investigation; (4) Contaminant Migration Studies; (5) Composite Sample for Testing; (6) Composite Sample Testing; and (7) Conceptual Dredging and Disposal Alternatives and Costs. The Corps of Engineers expects to complete its study and submit a final report to the Environmental Protection Agency 18 months after the start date, which is currently dependant on the funding availability and the status of Superfund (CERCLA) reauthorization. This Introduction/Executive Summary summarizes the purpose and scope of each of the seven tasks.

The innovative laboratory tests described in Tasks 4 (Contaminant Migration Studies) and 6 (Composite Sample Testing) are the critical elements of the Engineering Feasibility Study. The majority of these laboratory tests were originally developed by the Corps in their Management Strategy. The Corps developed the Management Strategy to provide a "technically feasible and environmentally sound strategy for the disposal of dredged materials" based on years of ongoing research and experience by Corps dredging and disposal experts. Some tests have been modified for the New Bedford site to address site specific dredging and disposal issues. Tasks 1,2,3 and 5 were developed to provide the necessary supporting information for developing implementable dredging and disposal alternatives.

Superfund Records Center  
SITE: New Bedford  
BREAK: 4.07  
OTHER: 50108

### Task 1: Baseline Maps and Controls

In Task 1, the Corps will prepare maps of the estuary and shoreline areas that show more accurately the water depths and ground elevations. A detailed map is necessary to define the precise volume of material which EPA would have to dredge to remove contaminated sediments. These maps will not only support the development and evaluation of the dredging and disposal options, but will also be used by the Corps to control the locations of the sampling points in their field sampling program (Task 2). Finally, these detailed maps will be used later by EPA and the Corps in designing and constructing a remedy.

### Task 2: Sediment Characterization

After reviewing the existing data, the Corps has recommended that additional sampling be conducted to support Tasks 4, 5 and 6. This sampling is designed to fill existing data gaps, particularly on the depth of contamination and on the physical properties of the sediments. Samples will be collected at 150 stations in the estuary and adjacent wetlands. Thirty (30) of the samples will be initially tested for chemical and physical characterization. The EPA and the Corps will jointly determine whether additional analysis is necessary as the purpose of this sampling is to (1) aid EPA and the Corps in developing a representative sample (Task 5) and, (2) define the depth of contamination or the volume of material which would have to be dredged to remove contaminated sediments.

### Task 3: Geotechnical Investigation

The purpose of these investigations is to provide additional information on the physical characteristics of the soil underlying the estuary. Information on groundwater elevations will also be obtained. This data will be used to more accurately evaluate the technical feasibility and costs of constructing various types of disposal sites. The primary work elements of Task 3 will be the drilling of exploratory borings and observation wells into the bottom of the estuary.

### Task 4: Contaminant Migration Studies

Task 4 involves a variety of studies designed to evaluate the amount of contaminants that would be expected to move out of the estuary with and without dredging. Various ways to control any contaminant releases during dredging will also be studied, including a determination of the most effective type and operation of the dredging equipment. Foreign and innovative equipment will also be investigated. Two types of experiments will be performed including: 1) a series of laboratory tests to study the types of sediment material that may be released if disturbed by dredging, and the associated contaminant levels which could be released to the environment; and 2) a series of experiments in a laboratory tank to determine the relationship between the flows (currents) in the estuary and the amount of sediment that would be eroded from the

bottom or that would settle to the bottom of the estuary. Also included in Task 4 will be the collection of field data on tides and currents to be used in calibrating the computer model which will predict sediment movement.

The information obtained in the various studies will then be combined to predict contaminant movement within and out of the estuary under present conditions, during dredging, and after completion of dredging.

#### Task 5: Composite Sample for Testing

Based on the results of the chemical and physical testing of sediment samples in Task 2, a decision will be made on the type and location of sediments that would be most representative of the conditions in the estuary. This decision will likely require the collection and mixing of sediment samples from a number of locations. In Task 5, a large quantity of this representative material will be collected, properly mixed, and transported to the Corps' laboratory for subsequent testing. This sample will then be tested for leachate potential from a disposal area, i.e. the potential for any of the types of contaminants represented in the composite sample to leach into the environment. Several composite samples, representing different areas of the hot spot, will be developed for the tests on the potential for contaminant releases (dredging impacts). Here, composite samples are used to simulate the mixing action of the dredging equipment.

#### Task 6: Disposal Alternatives Composite Sample Testing

Task 6 will consist of a series of laboratory tests developed by the Corps to evaluate contaminated dredged material for purposes of selecting appropriate disposal alternatives. The tests, which will be performed on the representative (composited) sample collected in Task 5, include:

- ° Complete chemical analysis to fully characterize the composite sample prior to the initiation of other tests.
- ° Tests to determine the physical properties and settling behavior of dredged sediments when placed in a disposal site, and the quality of the water that would be ponded above the settled material and would require treatment prior to its release back into the estuary.
- ° Tests to determine if rainwater would cause a release of contaminants from dredged sediments in the disposal site, and the associated effects on treatment requirements. These tests will utilize a special rainfall simulator developed by the Corps.
- ° Two types of tests to predict the quality of water (leachate) that would be potentially released from the bottom and sides of an unlined disposal site. These tests will be run under different types of conditions since the exact environment of

the disposal site may change with time. A principal reason for these tests is to determine if a lined disposal site will be necessary to adequately protect surface water and groundwater.

- Laboratory tests to determine the thickness of clean material that would have to be placed over contaminated sediments in order to prevent the future upward movement and release of contaminants. These tests are necessary for the evaluation of the subsurface disposal and the hydraulic control with sediment capping options.
- Laboratory tests to assess the feasibility of using various chemical additives to promote settling and clarification within the disposal site. Appropriate chemicals and dosages will be selected.
- Tests to evaluate the consolidation properties of the sediments to be dredged. This will be important to the determination of the required storage capacity of the disposal site, and in assessing the feasibility of disposal in subsurface cells.
- If needed, tests to evaluate whether the chemicals present in the sediments will cause a long-term deterioration of commercially available liner materials for the disposal site.
- Tests to determine if commercially available materials can be effectively used to solidify or stabilize the sediments prior to disposal. Such treatment would help reduce the amount of leachate released from the disposal site, and would also improve the engineering properties of the sediment to stabilize the disposal site.
- Laboratory studies to determine both the need for treatment of the water to be released from the disposal site, and the types of treatment processes that would be most appropriate and effective.

#### Task 7: Conceptual Dredging and Disposal Alternatives and Costs

The final task will involve the development and evaluation of the most feasible dredging and disposal alternatives based on the findings in Tasks 1-6. These conceptual alternatives will be developed at a sufficient level of detail to determine technical feasibility and to develop meaningful cost estimates.

Several elements of the Corps' study are already in progress. Completion of all tasks is scheduled for 18 months after the start date, at which time the dredging and disposal options developed in this study will be incorporated into the overall Feasibility Study being conducted by EPA.